



# Magnetic mixing approach creates quite a stir

## Solving the problem of mixing liquids in tiny volumes

By Stephanie Holinka

Researchers use microfluidic devices for testing in bio labs and as micro-reactions cells for chemical sensing and fluid analysis. Microfluids often must be mixed but right now scientists lack a simple and reliable way to do it.

“Mixing liquids in tiny volumes,” says materials scientist Jim Martin (1112), “is surprisingly difficult.” When fluid is pushed down a big pipe, Jim explains, eddies are generated; as the eddies swirl, they create mixing. But if fluid is pushed down a small pipe, there are no eddies. And no eddies means no mixing — unless you subject the fluid to tremendous pressure, which isn’t usually easy or feasible.

Researchers in the laboratory and in industry have tried a wide range of approaches to create mixing in microfluids, with only “mixed” success.

“In small devices,” Jim says, “people have tried all kinds of pillars and mixing cells to initiate mixing, but these approaches don’t work well.”

*(Continued on page 10)*

*“In small devices, people have tried all kinds of pillars and mixing cells to initiate mixing, but these approaches don’t work well.”*

— Jim Martin

KYLE SOLIS (in photo at left), a graduate student intern in Nanomaterials Sciences Dept. 1112, prepares a sample for mixing using a new approach called vortex field mixing, developed by researchers in his organization.

(Photo by Randy Montoya)

# Sandia LabNews

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# BlackBerrys to be allowed in tech areas

## Sandia is first lab in complex to establish limited area usage

By Julie Hall

If you’ve seen someone talking on a BlackBerry recently inside Sandia’s limited area, don’t be alarmed. While general use of cell phones (including smart-phones) is still prohibited “behind the fence,” the first stage in a phased introduction of Sandia-owned BlackBerrys into limited areas at the New Mexico and California sites is under way.

Sandia was the first facility in the nuclear weapons complex to allow BlackBerrys inside limited areas.

*“I think the use of these devices at the laboratory will probably explode and I think it will be a game changer.”*

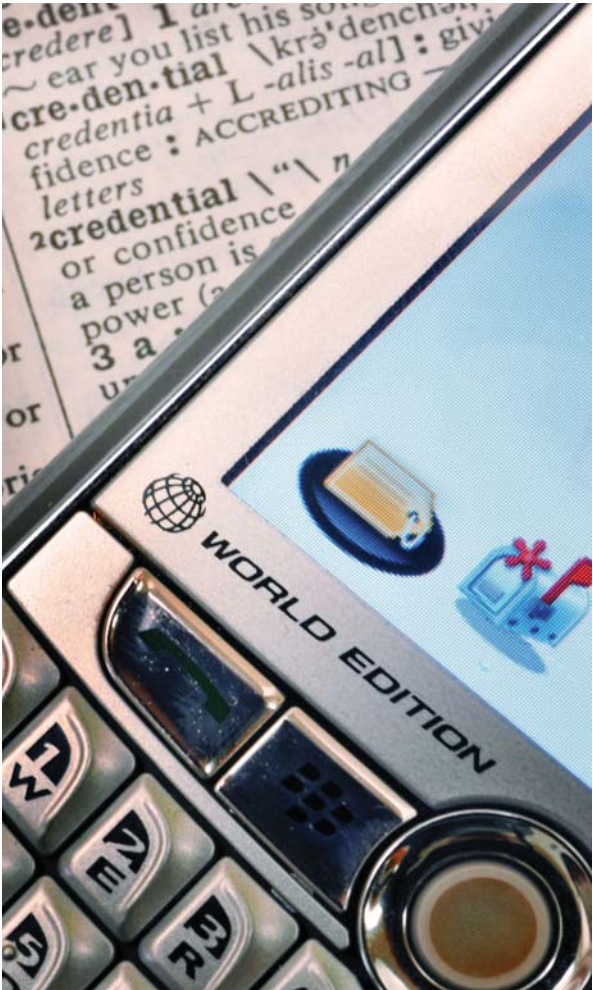
— Scott Rogers

Since Aug. 13 about 400 individuals have been approved to take the training that allows them to bring their BlackBerrys inside the limited area. While no target date has been set, all 1,400 or so Sandia BlackBerrys will be permitted in tech areas, after training occurs, by the end of the program barring any unforeseen security concerns, says Chief Information Officer Art Hale (9600).

A primary goal of the effort, he says, is to empower the workforce with a secure means of communication that can lead to higher levels of productivity with existing staff and resources. The intent is to eventually replace all government-issued cell phones with Sandia-issued BlackBerrys.

“One of the biggest advantages is that this will allow people to stay connected at all times, which is what the BlackBerry is intended for in the first place,” says Scott Rogers (9329), manager of Infrastructure Computing Services. “Not only can users access their Microsoft Outlook calendars and email, they can also be accessible by phone.

“I think the use of these devices at the laboratory will probably explode and I think it will be a



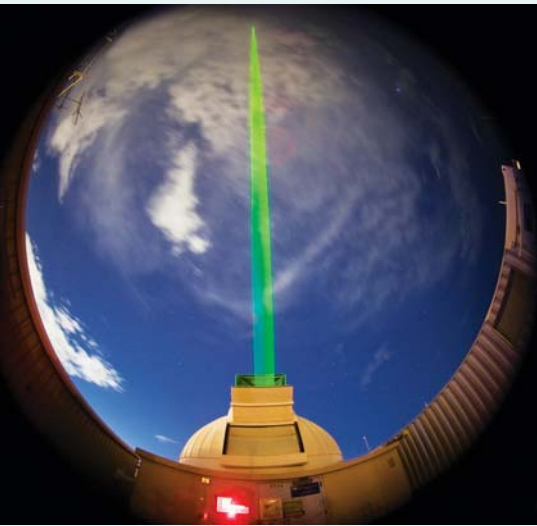
PROPERLY CONFIGURED, Sandia-owned BlackBerry devices are now being allowed into limited areas. Authorized devices have a credential icon, as seen on the left of the screen above.

(Photo by Randy Montoya)

game changer,” Scott adds. “It’s all about a team having a vision about having BlackBerrys in the tech area and seeing that vision come to fruition

*(Continued on page 4)*

## Inside



Night vision: Sandia’s LAZAP team loves dark skies for satellite calibration mission. Story and photos on pages 8-9.

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That’s that

A few weeks back, I wrote admiringly of Div. 1000 VP Steve Rottler’s continued self-identity as an engineer. And I noted that I – despite having a job history that reads like the dust jacket blurb of a first-time novelist – still consider myself a writer. In that column, I asked readers how they self-identify and got some nice responses. My favorite is the one I got from a reader whom, for reasons that only he and I know, I’ll call Delbert Mace.

“I always self-identify as an engineer,” wrote Delbert. “If the context calls for it, I’ll elaborate and call myself a civil engineer. It’s a short explanation that satisfies everyone and at one time it was actually true. When I think about all that I do here at Sandia that isn’t really engineering and how it outweighs the work that is, I think that I should find a more accurate title for myself. I’ve settled on ‘Employee.’ If I ever use up all those business cards on which I wisely did not print my department number/name, I’ll make that my title.” I like it, Delbert.

Along these lines, my wife remembers that when she was a little girl she had to fill out a form at a local school about what her parents did. Now, her father – my father-in-law – was a naval aviator, but somehow I guess that didn't sound like a real job to my wife when she was seven or eight years old. So in the place on the form that asked her what her Dad did, she wrote “worker.”

To our kids, maybe that’s what we are, regardless of what we call ourselves – engineers, writers, accountants, physicists, custodians, and cooks – we’re all workers and together, we’ve done some pretty darned good work around here over the past 60 years. You might even say exceptional work.

\* \* \*

Wrote a while back about the little frustrations you go through in changing your Kerberos password. Turns out, not long ago, my password expired and when I went to generate a new one – Voila! I got a nice number/letter combination on the first screen. Felt like hitting all sevens on a slot machine. That gave me an idea: How about this for a cool Kerberos application? It’s designed so that you pull a virtual “handle” to spin up a new number, which would show up like the numbers on a slot machine. And here’s a wrinkle to make it interesting: You only get a certain undisclosed and random number of pulls. So you have to decide whether to take the Kerberos password that comes up or spin again, hoping for a better one. Thing is, if you run out of spins (and you never know when that’s going to happen) you’d get stuck with the last offering no matter how bad it was.

\* \* \*

Anyhow, I got this nice new password but here I am three weeks later, still wanting to type in my old password. Anybody know how long this muscle memory stuff lasts? It’s driving me nuts.

\* \* \*

Sandia has found its way to the *New York Times* bestseller list. Sort of. Got a note from Dell Bayer, a senior research librarian over in the Technical Library. She’s come across a reference to Sandia in Dan Brown’s new book, *The Lost Symbol*. Brown, you may recall is the author of *The Da Vinci Code*, which only sold umpteen million copies. It’s a sure bet this new book will sell well, too, getting Sandia’s name out in front of a lot of people. The passage – on page 231 of Dell’s edition of the book – mentions a Sandia-developed nonlethal technology that Brown calls Silly String. When you read the passage, it seems clear that he’s talking about a refined version of sticky foam, a technology Sandia developed more than a decade ago. Not the latest cutting-edge stuff, for sure, but it’s a positive citation – and he spells our name right.

See you next time.

– Bill Murphy (505-845-0845, MS0165, wtmurph@sandia.gov)

Sandia’s Jerilyn Timlin earns NIH award for research into protein interactions

By Mike Janes

Sandia chemist Jerilyn Timlin (8622) has been presented by the National Institutes of Health (NIH) with a New Innovator Award, one of 55 such awards granted by the NIH this year. The award encourages



SANDIA CHEMIST Jeri Timlin will use her National Institutes of Health award to develop state-of-the-art imaging technology that can measure protein complex formation and protein networks. (Photo by Lloyd Wilson)

researchers to explore bold ideas that have the potential to catapult fields forward and speed the translation of research into improved health.

Jeri received the award for her project, “Multiplexed measurements of protein dynamics and interactions at extreme resolutions.” The work aims to develop state-of-the-art imaging technology that can measure protein complex formation and protein networks in a multiplexed fashion with spatial resolution beyond that of the optical microscopy.

“I’m so grateful to have this opportunity to equip the field of biological imaging with a new analytical tool for visualizing and quantifying multiple protein interactions,” Jeri says. Jeri’s award is for \$1.5 million over five years.

“As one of only 55 Innovator Award recipients nationally, this is a tremendous accomplishment for Jeri personally,” says Glenn Kubiak, director of Center 8600 and the Sandia Bioscience Research Foundation. “It is also a very significant confirmation of the continuing maturation of Sandia’s bioscience capability.”

NIH has granted 115 awards under three innovative research programs supported by the NIH Common Fund’s Roadmap for Medical Research. The Common Fund supports cross-cutting, trans-NIH programs with a particular emphasis on innovation and risk-taking.

“The appeal of these programs is that investigators are encouraged to challenge the status quo with innovative ideas, while being given the necessary resources to test them,” says NIH Director Francis S. Collins. “The fact that we continue to receive such strong proposals for funding through the programs reflects the wealth of creative ideas in science today.”

More information on the New Innovator Award is at <http://nihroadmap.nih.gov/newinnovator>. For descriptions of the 2009 recipients’ research plans, see <http://nihroadmap.nih.gov/newinnovator/Recipients09.asp>.

Retiree deaths

Elaine F. Brooks (age 85)	March 29
Elizabeth A. Dietrich (86)	April 25
Harry R. Guest (90)	Aug. 20
Perry K. Lovell (81)	Aug. 21
William E. Caldes (87)	Aug. 25
G. Lawrence Lane (74)	Aug. 26
Antonio Skender (81)	Aug. 28
Jose A.C. Chavez (84)	Aug. 29
George J. Saviteer (86)	Aug. 31
Gerald W. Bollig (70)	Aug. 31
R. Stanton Reynolds (84)	Sept. 1
Manuel Archuleta (75)	Sept. 4
Richard J. Mickey (84)	Sept. 13
Charles T. Duffey (87)	Sept. 19

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Society of Vacuum Coaters Topical Conference in Albuquerque Nov. 3-5

The Society of Vacuum Coaters is holding its inaugural Topical Conference (TopCon) Nov. 3-5 at the Albuquerque Marriott. The conference focus is “Advanced Coating Technologies for Corrosion/Erosion and Decorative Coatings — Alternatives for Electroplating Techniques.”

The conference will discuss existing and potential applications of advanced coating technologies for high-volume and demanding applications in various industries. It will also offer a unique forum for discussing these subjects from both fundamental and industrial perspectives. Particular emphasis is being given to alternative technologies, which are aimed to replace wet chemical methods, with applications for automotive, aerospace, energy/military, and consumer products.

The technical program will open Nov. 4 with a presentation by keynote speaker F. Doug Wall, manager of Corrosion and Electrochemical Sciences Dept. 1823. He will speak on “The Role of Corrosion Resistant Materials in the License Application for a Repository at Yucca Mountain.” Other invited speakers and presentations are listed in the TopCon preliminary program at <http://www.svc.org>. Register at <http://www.svc.org/topconregistration>.

The Topical Conference is cosponsored by Sandia.



# RDCDS set to expand at New York, California pilot events

By Mike Janes

The Department of Homeland Security’s Rapidly Deployable Chemical Detection System (RDCDS), in which Sandia has played a leading development role, has made a big splash these past few years, having been deployed to venues such as the Rose Bowl in Pasadena, McAfee Stadium in Oakland, and the Democratic National Convention in Denver. Designed and built by Sandia with contributions from Lawrence Livermore National Laboratory and Pacific Northwest National Laboratory, the RDCDS provides early warning of an attack from either chemical warfare agents or toxic industrial chemicals at high-profile special events.



SANDIA’S RAPIDLY DEPLOYABLE Chemical Detection System (RDCDS) includes multiple overlapping detection technologies and live video. Here, Steve Orth (8125) adjusts a detection module while a video camera looms in the foreground. (Photo by Randy Wong)

The RDCDS is designed to provide broad, high-confidence coverage of more than 40 different chemicals using multiple overlapping detection technologies and live video. But Nate Gleason (8125), who serves as Sandia’s RDCDS program manager in support of the DHS program, says detection is only one part of the overall protection puzzle. So this year, armed with a \$400,000 increase in DHS funding, Sandia’s researchers are moving forward with a comprehensive chemical defense

architecture that goes beyond a mere detection system. **Venue selection and response time**

“A detection system in isolation is useless. If you don’t do something when the detectors alarm, then why bother detecting in first place?” Nate asks. Sandia’s emphasis, however, isn’t merely focused on response plans. Nate says the work starts with venue selection and continues systematically. “We need to start with a full threat and vulnerability assessment of the venue and we need to figure out the possible and likely attacks on that venue,” he says. “What exactly are we protecting against? What options do the venue operators currently have that can take those threats off the table? Those are the kinds of questions we’re asking, and only then can we determine what elements from the RDCDS we can provide that will enable venue operators to execute the proper responses.” For example, Nate says, consider a typical football stadium packed with some 60,000 spectators. A detection system, all by itself, might adequately detect a dangerous chemical release. But if it hasn’t been determined previously just how long it will take to evacuate the stadium, the detectors could prove useless if not enough warning time for emergency personnel has been allowed to usher fans out of the venue in a safe and orderly fashion. To address these and other issues, DHS has directed Nate and his colleagues to expand the RDCDS capability on its behalf by executing two pilot activities in the coming months.

## Urban Shield exercise tests elements of detection system

Sandia is gearing up for a local exercise that will test at least one important element of DHS’s Rapidly Deployable Chemical Detection System (RDCDS). In late October, Sandia will participate in Alameda County’s Urban Shield exercise, touted as “a real-life, tactical multidisciplinary training exercise.” With a multitude of regional agencies supporting the weekend event, the exercise will simulate a terrorist attack on a nearby nuclear facility. Though RDCDS’s full capability will not be exercised, says Nate Gleason (8125), event organizers are interested in the system’s ability to quickly deploy a video monitoring system consisting of a full suite of cameras, video recording, and networking capabilities. “The goals are to stream live video directly to exercise controllers and to record the proceedings for analysis later on,” says Nate. Though the RDCDS can conduct its video surveillance activities remotely, Sandia will likely have a staff member on site during the exercise in order to more effectively communicate with controllers.

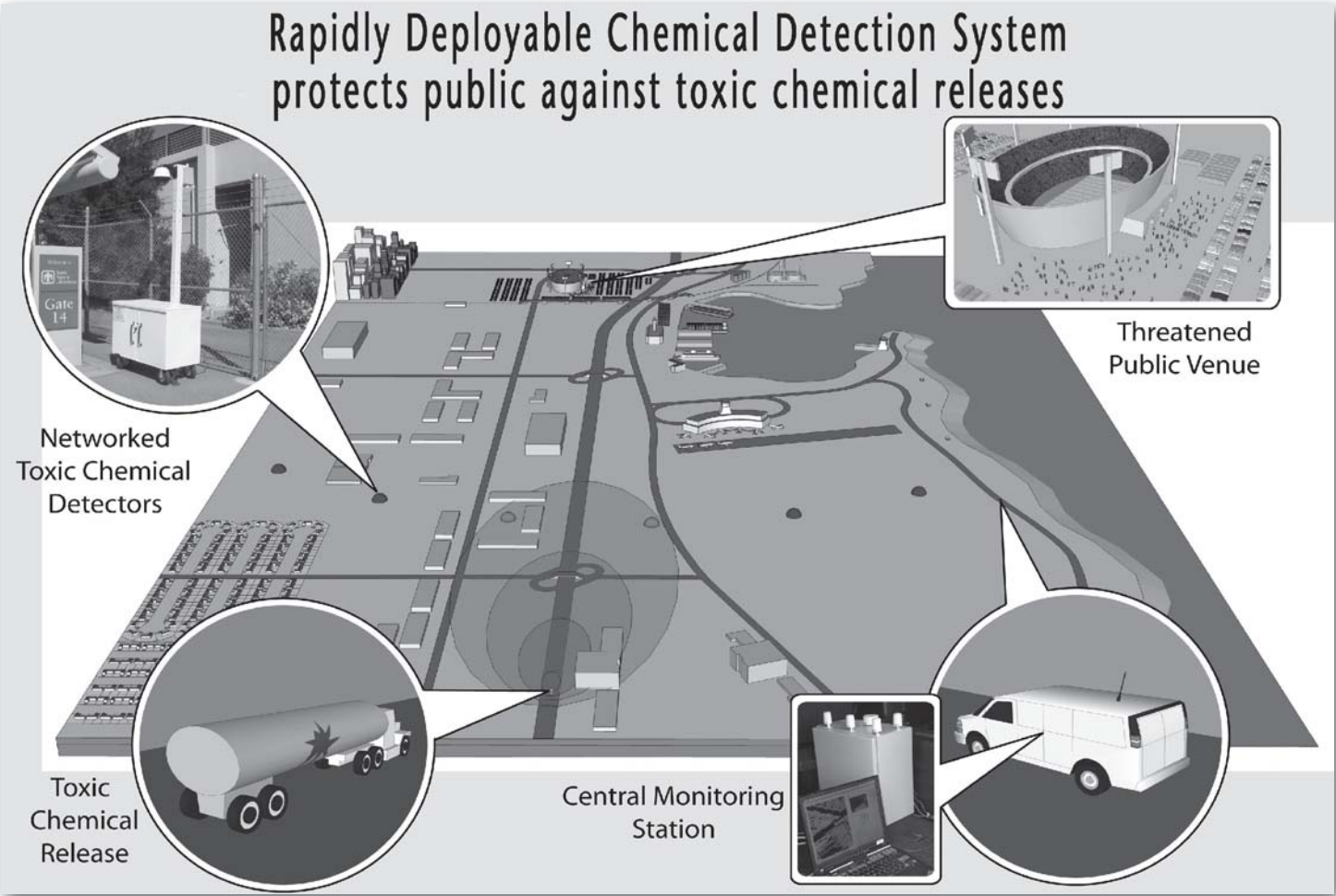
# Sandia California News

## Pasadena and New York City

For the next several months, the Sandia team will focus on the Jan. 1 Rose Bowl game in Pasadena. For that event, templates and checklists are being developed to assess the venue and the surrounding area. One asset the researchers will leverage, Nate says, is existing databases on chemical infrastructure in and around Pasadena, including chemical storage tanks, plants, or even shipment routes — all considered sources of risk.

This, he says, will give the team a more thorough understanding of how terrorists might plan an attack and what resources they might have available to them. The other upcoming pilot, due to take place in the spring, will occur at New York City’s Port Authority Bus Terminal (PABT), which sees some 250,000 passengers come through its turnstiles every day. Though DHS has deployed RDCDS to other indoor venues in the past, the PABT — the world’s busiest bus terminal — presents a unique set of challenges.

Unlike other indoor venues where RDCDS has been deployed, the PABT is a facility that needs to be protected 24/7, not just for a one-time event. Though seven of the eight RDCDS detectors are capable of continuous operation, Nate says one of them currently has only a 500-hour life span, good for no more than a couple of weeks. Sandia’s RDCDS team, consequently, will replace the eighth detector for the PABT pilot and will also analyze a number of new detection technologies. In addition, biotectors will be included in the PABT pilot, as the ultimate goal of RDCDS is a full chemical, biological, and radiological detection capability. Sandia’s specific RDCDS customer, the Department of Homeland Security’s Office of Health Affairs, has increased the program’s funding to roughly \$1.6 million this year, signifying a new level of commitment and interest in the program. “The program seemed to be stuck in neutral for a while, with no new detection hardware and no new initiatives,” says Nate. “The new program manager has a clear vision for the RDCDS, and he seems determined to make it really worthwhile.”



SANDIA’S APPROACH WITH THE RDCDS begins with venue selection and moves ahead systematically. The process typically includes a full threat and vulnerability assessment of the venue, after which venue operators are asked to determine the threats they are protecting against. Response plans or other options available to remove or counter those threats can then be initiated to meet those needs.



# BlackBerrys

(Continued from page 1)

after five years of work.”  
Marcia Jacobs (8949), the BlackBerry team lead at Sandia/California, says that BlackBerry use on site will help meet the business needs of many Sandia organizations. “For example, as we incorporate program- or corporate-specific applications to the device, we’ll enable organizations to respond in a timely manner to team tickets or emergencies, using Office Communicator as a nonintrusive means to provide video setup support,” she says.

## Some tradeoffs necessary

The project stemmed from the efforts of the CIO’s office, the Safeguards and Security Center, and members of the California site to enhance productivity with a more secure means of communication than what is available with existing government-issued cell phones. The group’s detailed risk assessment concluded that some functions of the BlackBerry would need to be disabled to meet the project’s security objectives.  
As a result, users will find they’ll have to give up some functionality in exchange for being able to use their BlackBerry within limited areas. The recording feature has already been disabled for all BlackBerry devices through the BlackBerry enterprise server. If users want to take their BlackBerry into the limited area, Bluetooth and camera/video recording functions (available on some models) will also be disabled.  
If users decide those functions are more important than bringing their BlackBerrys into limited areas, they may choose to not participate in the program, says Mike Gomez (9611), an information policy analyst overseeing the effort from the CIO’s office.  
The modifications occur as part of the credentialing process. Before entering the limited area, BlackBerry users must complete user compliance training. Once training is completed and users agree to Sandia’s BlackBerry Limited Area Rules of Use, Bluetooth and camera functions are disabled through the BlackBerry enterprise server. The rules of use define specific conditions that need to be met when using the device within limited areas; failure to comply with them may result in a security infraction.  
Credentialed users receive a gold icon on their BlackBerrys, which they are required to show if challenged for having a cell phone in the limited area. Clicking the icon displays information about the device and user.

*“One of the biggest advantages is that this will allow people to stay connected at all times, which is what the BlackBerry is intended for in the first place. Not only can users access their Microsoft Outlook calendars and email, they can also be accessible by phone.”*

—Scott Rogers

## Cell phones, iPhones are different

The introduction of BlackBerrys into limited areas does not necessarily mean a similar approach will be used with other types of cell phones, says Brian Bielecki, director of Safeguards & Security Center 4200. The intent is to eventually replace all government-issued cell phones with Sandia-issued BlackBerrys.  
A key difference is that BlackBerry capabilities — such as Bluetooth, use of applications, etc. — can be managed centrally from the BlackBerry enterprise server. Research In Motion, which introduced the BlackBerry smartphone in 2002, has long targeted the enterprise market and places an emphasis on security for its devices, Mike says.  
In 2003 the BlackBerry platform received Federal Information Processing Standards security certification from the National Institute of Standards and Technology — essentially giving the platform its nod of approval for meeting stringent government security standards, he says.

Sandia had to get approval from NNSA for its introduction of BlackBerry devices into limited areas. After a number of previous attempts at gaining approval, a new effort was launched in the summer of 2008. The effort was a partnership involving the

**Team members:** Art Hale (9600), Brian Bielecki (4200), Brian Maxwell (8949), Pat Manke (9335), Mike Gomez (9611), Ken Keahbone (9342), Robbie Evanoff (9342), Richard Pinsonneault (9343), Dallas Wiener (5632), Stephen Le (8945), Gerald Lagasca (8945), Chris Bringle (9343), Jeremy Baca (9312), Sebastian Rael (9343), Curtis Hodge (9335), Ed Witzke (6432), Jerry Rudolfo (9335), Ken Bernier (9335), Mike Schaller (4210), Anthony Aragon (4242), Roger Showalter (4241), Don Charlesworth (8511), Kevin Fahey (4241-3), Natalie Barnett (4242-2), John Long (9312), Scott Rogers (9329), Nicole Ballard (9343), Jarrod Collins (9329), Marcia Jacobs (8949), Matt Snitchler (9342), Herb Woelffer (8511)

CIO’s office, the Safeguards and Security Center, New Mexico and California BlackBerry team members, IT security, physical security, cyber security, and contracting. Many people across the laboratory contributed to making this happen, says Art. The Sandia Site Office approved Sandia’s proposal in August.  
Brian says that he and Art chose a phased implementation approach to control the introduction of risks associated with the change. “Lessons learned from each phase will continue to be incorporated to refine the applicable rules and training for subsequent phases,” he says.  
For more information see the BlackBerry wiki site (<http://tiny.sandia.gov/bb-wiki>) and the BlackBerry in the Tech Area FAQ (<http://tiny.sandia.gov/bb-faq>). To provide feedback about the program go to (<http://tiny.sandia.gov/BBFeedBack>).

## Diana de la Rosa honored for efforts to promote emergency management

### Receives award during meeting of N.M. emergency management group

Diana de la Rosa (4137) has received the New Mexico Emergency Management Association “Advancement and Promotion of Emergency Management” award. The award was presented at the recent NMEMA annual conference in Clovis, N.M.



DIANA DE LA ROSA accepts the Advancement and Promotion of Emergency Management award from New Mexico Emergency Management Association President Ken De Los Santos during the NMEMA annual meeting in Clovis, N.M.

## Sandia, NNSA Sandia Site Office sign 2010 PEP



PERFORMANCE METRICS — On Sept. 28, NNSA’S Sandia Site Office (SSO) and Sandia executive management signed the Performance Evaluation Plan for FY2010. The PEP documents the negotiated performance criteria by which SSO will appraise Sandia Corporation performance in its management and operation of Sandia in FY2010. Pictured left to right (seated) are: Sandia President and Labs Director Tom Hunter, Sandia Site Office Manager Patty Wagner, and Sandia Executive VP and Chief Operating Officer Al Romig. Standing is NNSA Sandia Site Office Deputy Manager Kim Davis. (Photo by Randy Montoya)



# Sandia at 60

Sandia National Laboratories' 60th anniversary celebration at the Capitol Visitor Center in Washington, D.C., on Sept. 16 included remarks from a host of VIPs about Sandia's significant role in helping protect Americans at home and abroad. Here are some of the highlights of what was said:



Photos by Lloyd Wilson

**Tom Hunter, Sandia President and Labs Director**

"As we celebrate 60 years of service, it's worth pausing and asking the question, 'What can we contribute further, what can we do to make this nation even stronger?' When our grandchildren are here 60 years from now talking about the contributions this country has made to the world, they'll know that the Department of Energy and Sandia National Laboratories have truly been noteworthy for more than a century."



TOM HUNTER

**Sen. Tom Udall, D-N.M.**

"I spent 10 years in Northern New Mexico with Los Alamos, learning from them. It's great now as a United States senator to also represent Sandia, to be able to learn from them."



TOM UDALL

**James Cicconi, AT&T Senior Executive VP**

"This is where they take an idea and turn it into a result. And that's what we're all here to honor and respect."



JAMES CICCONI

**Sen. Jeff Bingaman, D-N.M.**



JEFF BINGAMAN

"Our system of having national laboratories like Sandia is an example of how we've structured ourselves to allow people to do extraordinary things. I am here to congratulate all of you on this great anniversary and look forward to another 60 years."

**Dan Poneman, Deputy Secretary of Energy**

"This [the national labs] is the incubator where you have the smartest people working on the toughest problems. These are not people who are just trying to max out their long-term income curve; they're patriots and we really owe it to them to give them the acknowledgement, support and respect that they richly deserve. "The president has been very clear that while we have a nuclear deterrent, we're going to keep it safe, secure and reliable. Much of the work that keeps those words valid and true is going on at Sandia."



DAN PONEMAN

**Rep. Jerry McNerney, D-Calif.**

"The people who work at the labs are also great members of the community. They volunteer their time to education. So it's not only about service to science and the nation, but service to the community, service to the people who live in their area."



JERRY MCNERNEY

**Sen. Byron Dorgan, D-N.D.**

"It remains our commitment and must remain our commitment to be a world leader in science, engineering, and technology. And why is that important and related to Sandia? Because Sandia is one of our preeminent national laboratories. They are the crown jewels, in my judgment, of inquiry into science, engineering, and technology. Our weapons labs, our energy labs, our science labs are so unbelievably important to the future of this country."



BYRON DORGAN

**Rep. Martin Heinrich, D-N.M.**



MARTIN HEINRICH

"Earlier this year I read the Congress's Strategic Posture Review by William Perry and James Schlesinger. One of the most forceful recommendations they made in front of the House Armed Services Committee that I sit on is this idea that the president should designate our national nuclear labs as broader national security labs. And I would argue that Sandia is the prototype for that model as it exists today. In that role, Sandia has done more work for others than any other lab in directly addressing some of the most challenging national security issues facing our nation today."

# L D R D

## Laboratory Directed Research and Development

### LDRD program casts wide, successful net, concludes D.C. symposium

*‘For what you noticed when you were supposed to be doing something else’*

By Neal Singer

The program best known by its initials — LDRD — was the subject of a tri-lab symposium on infrastructure security held in Washington, D.C., by NNSA in August. LDRD stands for Laboratory Directed Research and Development, a highly valued program of Sandia and other national labs. “It’s the only program over which we have discretionary control in distribution of resources to aid our strategic sense of where we want to take the lab,” said

*NNSA’s LDRD program “has produced 25 percent of the labs’ peer-reviewed publications, 35 percent of NNSA lab patents issued, and 60 percent of their R&D 100 awards.”*  
— NNSA official Jamileh Soudah

VP Steve Rottler, new Chief Technology Officer (1000), whose address at the symposium focused primarily on cyber and energy security. “LDRD enables us to conduct high-risk, potentially high-value research in areas foundational to national security. We will be a forceful advocate for this work.” “The program’s impact far exceeds its cost,” said Jamileh Soudah, director of NNSA’s Office of Institutional and Joint Programs and NNSA program manager for LDRD.

#### Return on investment

She told her D.C. audience that the LDRD 8 percent “tax” — the assessment charged on all NNSA labs projects, used to fund LDRD — “has produced 25 percent of the labs’ peer-reviewed publications, 35 percent of NNSA lab patents issued, and 60 percent of their R&D 100 awards.” NNSA chief scientist Dave Crandall offered a poetic take on the program. “LDRD is for the [unexpected physical behavior] you noticed when you were supposed to be doing something else.” He listed a number of major inventions that were byproducts of other research — afterthoughts, really — some odd fact noted in passing. The point of LDRD is “to bring this research out of the back room,” he said. By openly funding ideas usually either ignored or worked on at night or on weekends, “LDRD has shaped the character of our labs more than anything except nuclear weapons.” Among the many issues of national interest mentioned by Bill Brinkman, director of the Office of Science, were better control of carbon dioxide emissions, better models for more accurate climate predictions,



A BRIGHT LIGHT AT THE MEETING — A hands-on demonstration of the winning poster at the recent LDRD meeting in Washington, D.C, caught the attention of conference-goers: a 20mA Li-ion battery bent around a 1.8V red LED. Based on Sandia technology, the battery can operate equally well outside of its package, even in the presence of oxygen or water, when its anode, cathode, and electrolyte are coated onto an arbitrary surface.

hybridizing the electric grid, natural gas as a possible stabilizer in fuel production for alternative energies, the nuclear fuel cycle, coal gasification, carbon sequestration, better and cheaper electric cars, and improved computer architecture and software “to take up the slack” from the nearly reached limits in making semiconductor circuits smaller.

#### The future of technology

Representatives from Livermore and Los Alamos national laboratories summarized their achievements on, respectively, climate change and bio threats, and electrical grid, gas networks, and border security. Other presenters from NNSA, DoD, the Department of Homeland Security, and the Office of Science and Technology Policy spoke on the future of technology, defense from the point of view of external and internal challenges, and possibilities of external funding after LDRD monies cease.

Also presenting were NNSA researchers from Savannah River, Kansas City, and Pantex, who participate in PDRD (Plant Directed Research and Development) — similar to LDRD but with smaller programs. The symposium’s rotating host this year was Sandia, which coincidentally also has the largest LDRD program of the three NNSA labs. This year, available funds at Sandia should be approximately \$160 million, said Steve Rottler. Sandia also was judged to have the best-of-show technology in a daylong 24-poster session culled by judges from 800 LDRD projects. Top honors were won by Chris Apblett (1815) and his team for a novel packageless battery that, by doing away with inert battery components, can enable more energy to be stored in four times less space. Though the poster competed against far flashier

*(Continued on next page)*



# Laboratory Directed Research and Development

*(Continued from preceding page)*

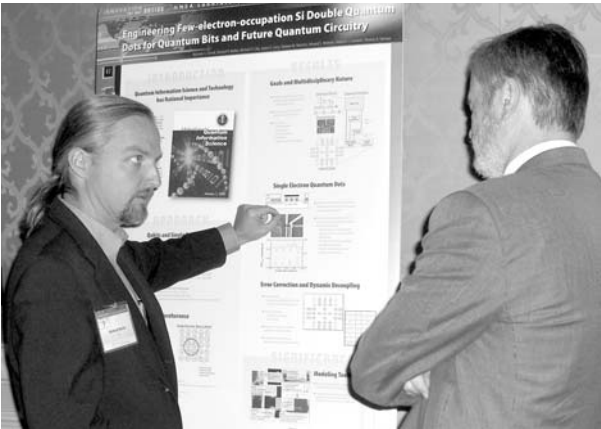
claims, “Four times reduction in size is four times reduction in size,” said one judge of the indisputable, bird-in-the-hand, engineering triumph of a small light bulb lit and extinguished over and over by a battery as thin as a postal envelope held in Chris’ hand.

### The genius of LDRD

Part of the genius of the LDRD program is that local control is valued.

This intellectual independence is helped by the architecture of the program, which is not funded by any one agency but instead by a tax levied on all work performed by Sandians. This self-supporting funding gives the program an economic footing for its mental independence. This year, the assessment is expected to be 8 percent, as agreed to in the Energy and Water Appropriations conference on Sept. 30 and adopted by the House of Representatives on Oct. 1.

Of course, independence is far from total, says LDRD program manager Hank Westrich (1011). Con-



RICHARD MULLER, an author of a poster on quantum information science, discusses the work with an attendee at the Washington, D.C., LDRD symposium. Other authors included Malcolm Carroll, Michael Lilly, James Levy, Thomas Gurrieri, Edward Bielejec, Andrew Landahl, and Thomas Tarman.

gress has high expectations for the impact from LDRD funding and NNSA has program oversight

responsibility. “We’d be silly if we didn’t listen and consider their input,” says Hank.

The concept of discretionary research at DOE labs originated in the language of the Atomic Energy Act of 1954. The wording, modified in 1977, authorized the then newly created Energy Research and Development Administration (ERDA) to use “a reasonable amount of its operating budget for the funding of employee-suggested research projects.” The LDRD program itself was formally created in 1991 under the National Defense Authorization Act. Though funding for the employee-led approach has varied over the past 55 years, the concept of employee-led research has permitted researchers to propose their research insights to local management for funding and achieve unusually good results.

Projects are generated at the principal investigator level. They usually offer \$500,000 per year in two- to three-year projects to selected researchers and \$3 million to \$5 million per year for so-called Grand Challenges. Progress is reviewed yearly, and funding can be terminated for a variety of reasons, including failure to reach milestones.

## Sandia’s 2009 LDRD highlights imaginative research

*Read the lists on this page to get an idea of some of the security-oriented, imaginative approaches funded this year by LDRD.*

*Award for Excellence winners (listed below), selected by Div. 1000 VP Steve Rottler, are eligible to compete for additional \$50,000 projects.*

### Oral presentations

- Overcoming jitter effects for remote staring sensors — Katherine Simonson (5535)
- Peridynamics as a rigorous coarse-graining of atomistics for multiscale materials design — Richard Lehoucq (1414)
- Enhanced performance of engineered neural networks using nanostructured probes and predictive computational modeling — Conrad James (1714)
- Vapor phase lubrication for advanced surety components — Mike Dugger (1813)
- Enhanced spontaneous emission rates in visible III-nitride LEDs using 3-D photonic crystal cavities — Art Fischer (1123)



### Award for Excellence winners

#### “Explosives Detection by Photo-Ionization Ion Mobility Spectrometry”

*The team successfully demonstrated a new generation of nonradioactive ion mobility spectrometer using a novel approach of photofragmentation-ionization.*

Principal investigator: Thomas Reichardt (8128)

#### “Science at the Interface: Grain Boundaries in Nanocrystalline Metals”

*Developing a fundamental understanding of grain growth in nanograined metals reveals the formation of unexpected structures and suggests a novel answer to a decades-old problem.*

Principal investigator: Stephen Foiles (1814)

#### “Data Mining on Attributed Relationship Graphs”

*Advanced the state-of-the-art in the mathematics of tensor analysis and its applications to data mining problems of interest to the scientific and national security communities.*

Principal investigator: Tamara Kolda (8962)

#### “Novel Virus Coagulants for Water Treatment and Biomolecular Structural Science”

*Substituting a single Ga<sub>3</sub><sup>+</sup> ion for every twelve Al<sub>3</sub><sup>+</sup> ions in water-treatment coagulants produces a much more reliable and effective reagent for removing waterborne contaminants.*

Principal investigator: May Nyman (6736)

#### “Developing Key Capabilities for Quantum Computing: Trapped Ion and GaAs Approaches”

*Through multidisciplinary and interdepartmental collaborations, this project has resulted in significant new infrastructure for developing and implementing device technologies for quantum computing at Sandia.*

Principal investigator: Matthew Blain (1725)

#### “Overcoming Jitter Effects for Remote Staring Sensors”

*A new method was created for real-time detection of transient change in scenes observed by staring sensors subject to platform jitter and other real-world challenges.*

Principal investigator: Katherine Simonson (5535)

#### “Passive and Active Electromagnetic Frequency Selective Surfaces for High-Power Beam Applications”

*Creating novel, reconfigurable, electromagnetic meta-surfaces, materials-tensor instrumentation, and beam transmission measurement system for radar-cross-section reduction applications relevant to national security mission of the laboratory.*

Principal investigator: H. Jacques Loui (5345)

### Poster presentations

- A radiation microscope for SEE testing using >10 GeV ions - Gyorgy Vizkelethy (1111)
- A zero-power, motion-sensitive MEMS wake-up device — Roy Olsson (1749)
- Active coded-aperture neutron imaging — Peter Marleau (8132)
- Advanced cathode and electrolyte for thermal batteries — David Ingersoll (2546)
- Automated Monte Carlo biasing for photon-generated electrons near surfaces — Brian Franke (1341)
- Computational and experimental platform for understanding and optimizing water flux and salt rejection in nanoporous membranes — Susan Rempe (8653)
- Compositional ordering and stability in nanostructured, bulk thermoelectric alloys — Douglas Medlin (8656)
- Computational mechanics for geosystems management to support the energy and natural resources mission — Charles Stone (1525)
- Cosmic-ray hydrometrology for land surface studies — Darin Desilets (6732)
- Deployable pathogen diagnostic system — Anson Hatch (8621)
- Development and characterization of 3-D, nano-confined multicellular constructs for advanced biohybrid devices — Bryan Kaeher (1815)
- Featureless tagging tracking and locating — Karen Coperich Branch (5345)
- High-temperature, large-format focal plane arrays for emerging infrared sensing applications — Jin Kim (1742)
- Highly pixelated hypertemporal sensors for global awareness — Rex Kay (5719)
- Host suppression and bioinformatics for sequence-based characterization of unknown pathogens — Todd Lane ((8621)
- Infrastructure for nondestructive real-time fingerprinting of integrated circuits — Todd Bauer (1746)
- Innovative control of a flexible, adaptive energy grid — David Wilson (6332)
- Intelligent front-end sample preparation tool using acoustic streaming — Darren Branch (1714)
- Intelligent power controllers for self-organizing microgrids — Shannon Spires (6332)
- Interfacial electron and phonon scattering processes in high-powered nanoscale applications — Patrick Hopkins (1513)
- Metamaterial science and technology — Mike Sinclair (1816)
- Micromobility propulsion — John Salton (6743)
- Modeling aspects of human memory and reasoning for scientific study — Michael Bernard (6341)
- Multiscale schemes for the predictive description and virtual engineering of Materials — Otto Anatole von Lilienfeld-Toal (1435)
- Nanomanufacturing: nano-structured materials made layer-by-layer — Peter Schunk (1516)
- Network design optimization of fuel cell systems and distributed energy devices — Whitney Colella (6332)
- Network discovery, characterization and prediction — Philip Kegelmeyer (8962)
- Oxygen insensitive anode chemistry to enable the spray paintable battery — Chris Applett (1815)
- Passive and active electromagnetic frequency selective surfaces for high-power beam applications — H. Jacques Loui (5345)
- Quantitative study of rectangular waveguide behavior in the THz — Mike Wanke (1725)
- Quantum information science and technology — Malcolm Carroll (1725)
- Radiation hardened components for space-qualified point-of-load power conversion — Brandon Witcher (5762)
- Reimagining liquid transportation fuels: Sunshine to Petrol — Jim Miller (1815)
- Scalable microgrid for a safe, secure, efficient, and cost-effective electric power infrastructure — Anthony Lentine (1727)
- Scalable solutions for processing and searching very large document collections — Danny Dunlavy (1415)
- Synthetic biology of novel thermophilic bacteria for enhanced production of ethanol from 5-carbon sugars — Rajat Sapra (8625)
- Templated synthesis of nanomaterials for ultracapacitors — Bruce Bunker (1816)
- Two-pulse rapid remote surface contamination measurement — Thomas Kulp (8128)
- Understanding and predicting metallic whisker growth and its effect on reliability — Donald Susan (1813)



# NIGHT VISION:

## Sandia's LAZAP team loves dark skies for satellite calibration mission

Story by Bill Murphy • Photos by Randy Montoya

*'Standby, Safety. We're making the move . . .'*

The voice from the control room is steady, practiced, confident, unhurried. Outside, a small observatory-like dome begins to rotate, gliding smoothly and quietly on well-oiled gears.

"OK, we're tracking, Safety. Are you guys good?"

Dave Denning (5737), surrounded by a suite of rack-mounted instruments and glowing LCD monitors, speaks into his headset mike, querying his team: Safety. Laser. Telescope.

One by one, they report back. "We're good."

Tonight, the group is firing a high-powered laser beam through the atmosphere, illuminating the optical sensors on a GPS Block II satellite in a semisynchronous orbit some 12,500 miles above the Earth.

As members of Sandia's LAZAP (Laser Applications) team, this night they're going through a process that has been played out thousands of times over the past 30-plus years.

### Supporting the test ban treaty

Sandia's LAZAP program was started in the mid-1970s to test and calibrate the optical sensor systems aboard America's Vela reconnaissance satellites. The Vela constellation was launched over a period of several years in the 1960s and 1970s to detect atmospheric nuclear detonations. It was part of a suite of technologies designed to monitor compliance with the 1963 Limited Test Ban Treaty, which forbade signatory nations from conducting above-ground nuclear tests.

By sending out bright laser pulses, LAZAP helped Vela controllers confirm that their satellites were, indeed, detecting bright optical events. LAZAP's laser flashes also enabled mission operators to periodically calibrate the Vela sensors in orbit.

Here's how it worked: LAZAP operators found and tracked a Vela satellite. (In the early days, this process was

done visually and manually using a powerful telescope; today the tracking is computer-controlled.)

Once the target Vela was confirmed, the LAZAP team fired a laser at the satellite, illuminating its optical sensors, which were optimized to pick up ultrabright, ultrafast flashes of light — the kinds of flashes that might characterize a nuclear blast.

### Modern systems still need to be calibrated

Since the LAZAP laser was being fired from a known location with known coordinates, testers could calibrate the sensors by comparing that known location with where the Vela satellite "thought" it saw the event. If, for example, the Vela thought the pulse of laser light was coming from, say, the vicinity of Amarillo, when it actually originated in Albuquerque, controllers could build in a compensation factor. That kind of precision would be vital in pinpointing the location of a treaty violation.

The process was not unlike zeroing in the sights on a rifle, getting the crosshairs on the scope to correspond to where the bullet actually hits the target.

The Vela constellation was replaced in the 1980s by the Defense Support Program (DSP) satellites and in the 1990s by the Global Positioning System (GPS) constellation. Both the DSP satellites and the modern GPS satellites still carry optical sensors. And even though they are more advanced, capable, and sensitive than Vela-era sensors, they must still be tested and calibrated much the same way their Vela forebears were.

That's why, on multiple dark, clear nights each year, the LAZAP team is still working late, tracking, locking on to, and laser-illuminating the latest generation of satellites that make up the space-borne component of the nation's nuclear detonation (NUDET) detection system.

### 'Ready to let the ruby out'

Tonight, the dome has stopped its rotation, its open slot aimed toward a point in the southeastern sky.

In his headset, Dave, who for the past several years has been the LAZAP project lead, is getting reports from his two visual aircraft observers and his radar controller. (The radar controller is working from a feed provided by a local FAA air traffic control center.) Visual and radar agree: The sky is clear. No aircraft are in the vicinity.

Dave glides effortlessly on his wheeled office chair from one side of the control station to the other, checking data on an LCD monitor. It's a chart displaying so-called predictive avoidance data; that is,

windows of time when LAZAP will not inadvertently illuminate nontargeted satellites. It's the space-based equivalent of making sure no aircraft are nearby. A quick check confirms: The window is open.

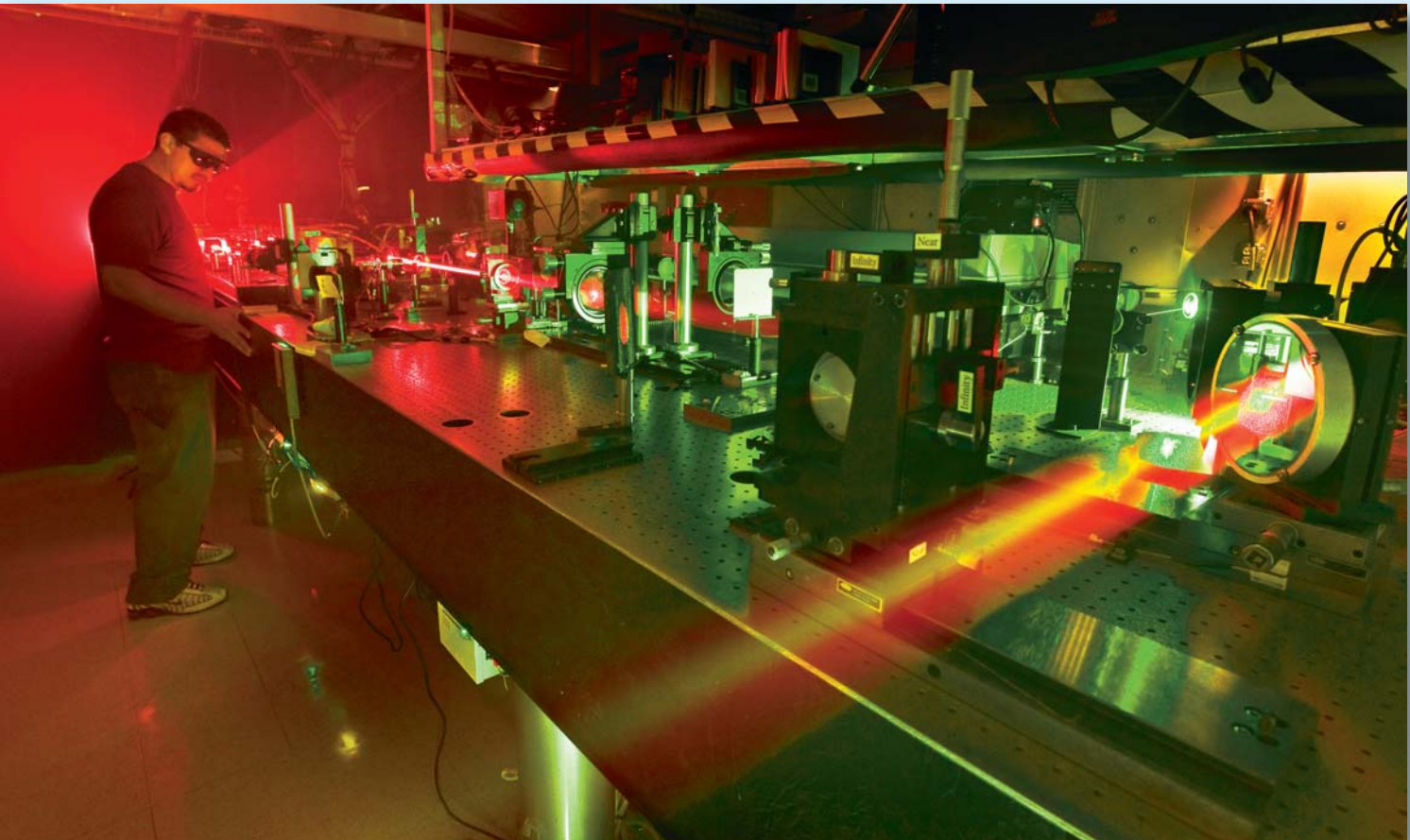
With everyone good to go, Dave says into his headset: "Team, I'm going to start shooting the ruby [laser]. I'm going to let the ruby out now." He counts down, "Five, four, three, two, one . . ."

### A green light shoots from the dome

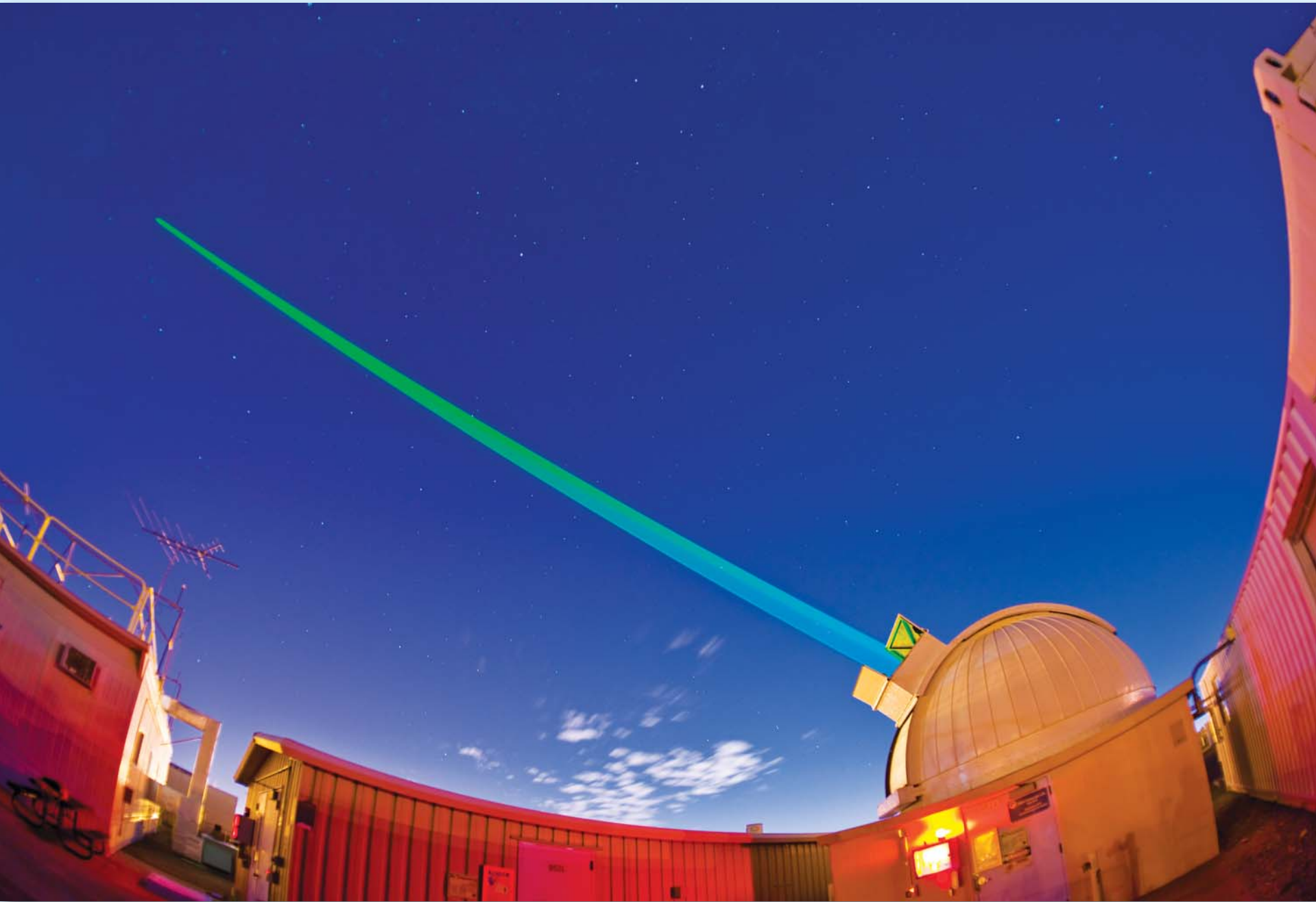
Outside, quick red flashes light up the slot in the dome. The Class 4 ruby laser is being pumped through a Cassegrain telescope beam director, which pinpoints the beam onto the target satellite.

Then, more dramatically, a green light shoots from the dome, its pulsating, concentrated beam slicing the sky and visible all the way to the very edge of the atmosphere. Dave explains, "Right now, we do all our calibration testing with the ruby laser, but there are some potential advantages to using the green laser, so we're doing some testing with it tonight."

While the test is going on, Victor Chavez (5737), the team's laser guru, comes in to tell Dave the laser may be on the verge of failing. That's something that happens periodically and something the team is ready to deal with. Tonight, though, the laser holds up and the data collection is good. Meanwhile, as the test proceeds, Gus Rodriguez (5737), who maintains the LAZAP electronics suite, is busy keeping the system up and running. Debra Yzquierdo-Trujillo (5737) is



LAZAP TEAM laser expert Victor Chavez ensures that the project's high-powered ruby and green lasers are performing at optimal capacity for a new round of calibration tests. LAZAP began in the 1970s to provide calibration data for the Vela satellite constellation.



A GREEN LASER shoots skyward as part of Sandia's Laser Applications (LAZAP) project. LAZAP uses high-powered laser beams as part of a process to calibrate optical sensors on GPS and DSP satellites. Currently, calibration testing is done using a ruby laser, but because there are some potential advantages to using the green laser, the team is evaluating it during real testing conditions. In this unretouched photo, a green laser beam is visible to onlookers out to the edge of the atmosphere.

on the radar board, monitoring air traffic, while the visual safety team outside continues to scan the skies.

### Placing the test on hold

Just as Dave is emphasizing that every member of the team can stop the laser firing at any time, he gets a call on his headset and an alert on the status board: One of the visual observers has put a hold on the test as an aircraft appears to be headed toward the quadrant of the sky where the laser is aimed. After a couple of minutes, the sky is clear again, Dave

initiates another countdown. The test resumes and continues until the target GPS satellite moves below the horizon.

Later, Dave says the previous night's tests gathered important data that will be useful in calibrating the spacecraft's optical sensor. With a constellation of more than 30 GPS satellites and with a number of DSP satellites still being used for NUDET applications, the LAZAP team has a busy and demanding schedule.

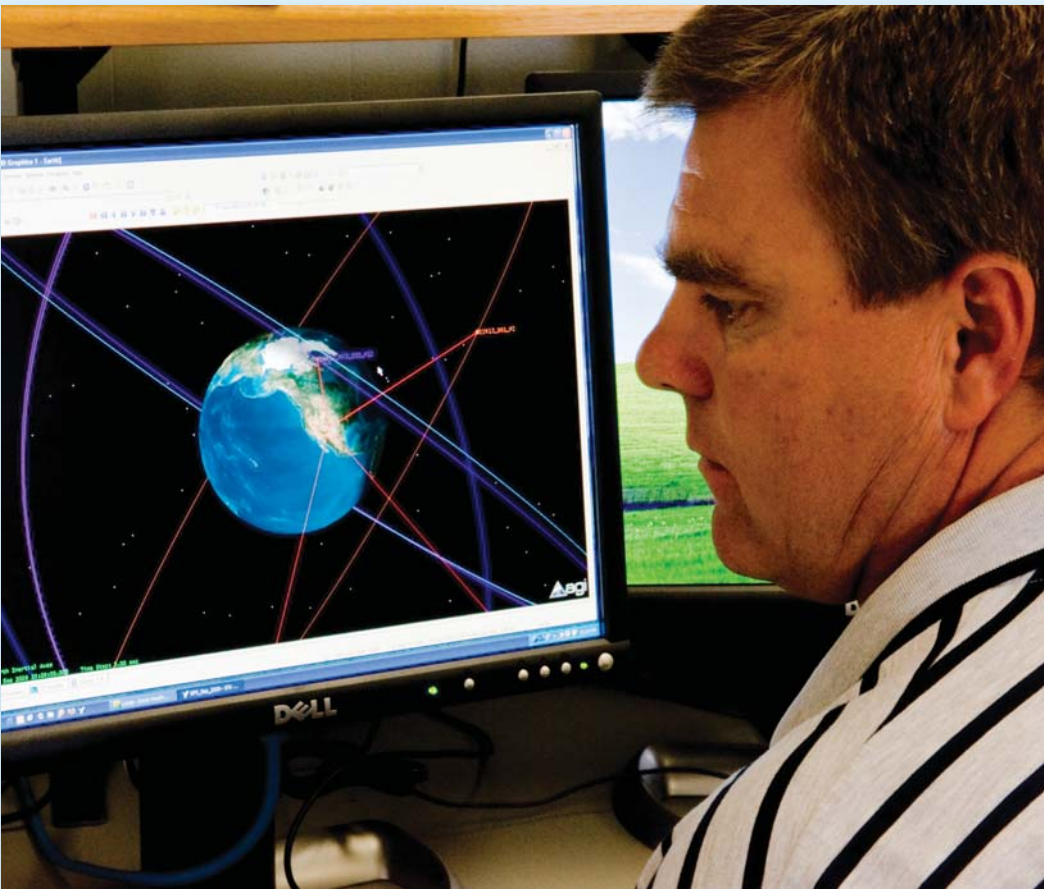
Throughout its 35-year history, LAZAP's primary customers have been the US Air Force NUDET Detection System

Program, which owns the satellite platforms that carry NUDET sensor technologies and the NNSA Office of Nonproliferation Research and Development (NA-22) and its predecessors in the Department of Energy. And as space-based optical sensor technology evolves — as will be the case with the upcoming GPS Block III constellation — LAZAP will evolve to provide the necessary calibration and testing protocols.

And, says Dave, "As long as there are optical sensors on board American satellites, we'll have an essential mission."



DURING A LAZAP TEST, Debra Yzquierdo-Trujillo keeps a close eye on the radar board, monitoring air traffic via a live, local FAA air traffic feed. Outside, two visual observers also watch the skies.



LAZAP PROJECT LEAD Dave Denning studies a monitor that displays the orbital planes of the GPS constellation. The LAZAP team creates light events that can be detected by optical sensors on board the satellites.



# Microfluidics

(Continued from page 1)

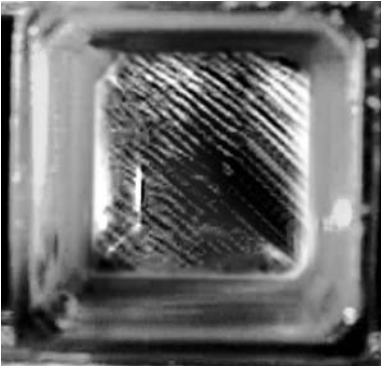
Researchers need simpler and more reliable ways to mix in tiny places such as micrometer-sized channels.

Jim’s discovery of how to mix tiny liquid volumes arose from LDRD-funded research directed at improving the sensitivity of the chemical sensors developed in his lab. That project, “Field-Structured Composite Studies,” was a joint effort with Rod Williamson (now retired). While their LDRD project did not lead to the expected results, Jim and Rod were surprised by the wide variety of physical effects they discovered along the way, including magnetic mixing. These effects, Jim says, ended up being much more interesting and important than the original goal.

Since the project began, DOE’s Division of Material Science and Engineering, Office of Basic Energy Sciences, has now started a new project whose goal is to better understand the fundamental science of field-structured composites. So the program succeeded even as it failed, and eventually Jim and PhD student Doug Read developed better ways to increase sensor sensitivity.

In the new method of mixing, when you turn on a particular kind of magnetic field, the magnetic particles suspended in the fluid form into chains — like strings of pearls — that start swirling around; that’s what does the mixing. The particles are then removed magnetically, leaving a nice mixed-up liquid.

More technically, the new mixing method, which Jim calls vortex field mixing, subjects a suspension of microscopic, magnetizable particles to a magnetic field whose direction is constantly spinning in a motion similar to a spinning top as it is about to collapse on its side, but much faster. In this “vortex field” the particles assemble into countless microscopic chains that follow the field motion, stirring every nook and cranny of the fluid. The vortex field stirs the liquid vigorously, and surprising fluid effects are possible, such as a kind of



THIS SCREEN CAPTURE from a video that depicts vortex field mixing shows the distinctive “venetian blind” striations that are characteristic of the process as magnetic particles suspended in the fluid form into chains in the presence of a magnetic field. The actual size of the area depicted here is about one centimeter square.

light in the September *MRS Bulletin*.

This type of magnetic mixing with particles that assemble into micro-stir bars isn’t like the magnetic mixing you remember from high school chemistry class.

“In your high school chemistry class,” Jim says “when you mixed a beaker of water on a stir plate, underneath the plate was a permanent magnet spinning around to make the stir bar spin. If that hidden magnet suddenly became twice as strong, the magnetic field would double but you wouldn’t see any increase in the stirring at all.

“With our process,” he says, “if we make the magnetic field twice as strong, the stirring becomes four times as strong because the stronger field makes the particle chains longer.”

With conventional stir-bar mixing you can increase the mixing torque by increasing the speed of the stir bar instead. It’s easy to feel this effect by simply holding the beaker slightly above the stir plate. In vortex field

washing machine agitation where the spinning direction alternates periodically.

Currently Jim, Lauren Rohwer (1715), and PhD student Kyle Solis (1112) work with the vortex field mixing, among other projects. Their experimental report, published in the July issue of *Physical Review*, has generated interest, including a *Physical Review Focus* article and a Research High-

*“With our process, if we make the magnetic field twice as strong, the stirring becomes four times as strong because the stronger field makes the particle chains longer.”*

— Researcher Jim Martin

mixing increasing the speed of the wobbling doesn’t help, because the chains simply break into smaller pieces and the mixing torque doesn’t change at all.

Vortex field mixing stirs just as effectively with magnetic nanoparticles as with traditional micrometer-scale powders. In fact, excellent mixing torques have been obtained using 100 nanometer particles. This means even the tiniest fluid volumes can be mixed, as well as the largest.

As strange as these effects are, they were initially predicted by Jim in a theory paper published in the January 2009 issue of *Physical Review*. This paper also explains why a simple rotating magnetic field doesn’t induce mixing and predicts the optimal wobbling angle of the magnetic field.

Vortex field mixing requires only the modest magnetic fields provided by simple wire coils that can be scaled to the size of the fluid cavity. After mixing, a researcher can trap the particles with a permanent magnet, decant the mixed liquid, and recycle the particles endlessly.

The impact of this new method of mixing is hard to predict, but its applicability to fluid volumes of all shapes and sizes suggests many applications will follow. But Jim’s lab has turned its attention to training magnetic suspensions to effortlessly conduct heat in any desired direction.

This work was supported by DOE’s Division of Materials Science and Engineering, Office of Basic Energy Sciences.

# Taming the email beast can save you time . . . and save the Labs more money than you might think

**Grassroots campaign pushes idea that the wild and unruly email beast can be tamed**

By Bev Ortiz (9342)

Email is a beast. Let’s face it. We all receive too much of it. We spend too much time during the day (or night or weekend) responding to it. It consumes us. Instead of a tool we use to facilitate communication, it has become our master and we its slave.

But what if you could save 15 minutes a day dealing with email? By the end of the week you would have saved 75 minutes. Doesn’t sound like much, but that is more than an hour you could dedicate to real work in one week. If you multiply that by the number of weeks you work in a year — say 46 — you now have made some serious progress; that’s 60 hours of real productive time in a year.

Now multiply that by the number of employees at the Labs and you now have 60,000 extra hours of productivity. Look at it slightly differently, and you’ve just saved the labs almost \$9 million annually.

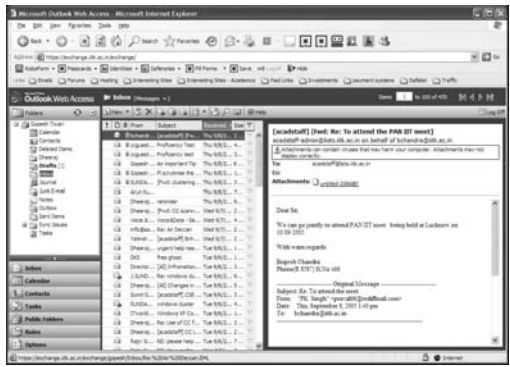
## Effort began several years ago

Believe it or not, it is possible to tame the beast. There are people at the Labs who are living proof that you can keep the beast in its cage.

The problem is not everyone knows the beast can be tamed. But right now a small group of people who are passionate about this topic are starting a grassroots effort to spread the word to really get everyone at the Labs to believe, “I can tame my beast.”

The campaign, called Taming the Email Beast, is a continuation of an effort started several years ago by the CIO organization. Over the years, the campaign’s sole purpose has been to help people at the Labs in any way, shape, or form respond to the email beast that consumes them.

- The campaign has produced the following:
- Mastering Email Beast class and time-management classes
  - Email beast site (<http://info.sandia.gov/EmailBeast/>) and time-management site
  - Email beast video campaign (currently a work-in-progress)



*What if you could save 15 minutes a day dealing with email? By the end of the week you would have saved 75 minutes. Doesn’t sound like much, but that is more than an hour you could dedicate to real work in one week. If you multiply that by the number of weeks you work in a year — say 46 — you now have made some serious progress; that’s 60 hours of real productive time in a year.*

To identify specific needs and concerns, the team has created an email beast survey (<http://tiny.sandia.gov/6zlxw>) and encourages Sandians to take it. The team intends to develop tips focused directly on specific concerns raised in the survey, and says it will find unique and creative ways to share them with the Labs. Possible venues for getting emails tips out into the Labs may include voicemail, websites, blogs, wikis, the What’s New on the Web portlet, demos at department and project meetings, word of mouth, and road shows.

According to survey input received so far, here are some of the time-saving tips people are seeking:

- Ways to deal with email just once
- Ways to avoid overlooking an email
- Easy ways to streamline searching for email
- How to use rules to automate handling some email
- How to avoid cleaning out old email by hand
- Tasks — let Outlook keep track of things you have to get done

\*\*\*

If you are interested in learning more about taming the email beast or even want to join the grassroots effort, contact Bev Ortiz (9342), Judy Sesma (6432), Cathy Sleeter (3623), Trish St. John (10613), Rosa Zalesak (10660-1), or Jeff Zirzow (6339).



# Why do I give?

**‘We had the biggest and sweetest melons,’ recalls Iris Aboytes**

By Iris Aboytes

I have been the Employee Caring Program publicity chairperson for the past few years. In that role, I’ve told you about young men, old men, young women, old women, babies, and lots and lots of beautiful children. I have written about my tours to various United Way agencies, but I have not told you why I give.

I grew up in northern New Mexico on a ranch with my parents Manuela and Gregorio Garcia, six brothers, and five sisters. One of my brothers and one of my sisters died as infants. One of my brothers was killed in an accident at age seven. One of my sisters died at 15. For a long time there were seven of us, but recently one of my brothers was overpowered by cancer.

To say my life growing up was full of ups and downs would be simplifying it. I can definitely say life was not boring. We had many challenges, but we also had many blessings.

Hard work was plentiful. Were we poor? No, I think we just did not have lots of things. We had enough to eat, a roof over our heads, warmth from a wood stove, and like my mom used to say, we had each other.

Christmas for us was a big pot of posolé cooking on top of the stove. Santa Claus would have it ready for us to eat after midnight Mass. My mom used to say Christmas was good. We were all healthy, happy, and all together.

“What more could we possibly want?” she would say.

Of course, we always thought of lots of things we



MANUELA AND GREGORIO GARCIA, parents of *Lab News* writer Iris Aboytes. Iris credits her mother as her inspiration for giving.

wanted. She and my dad would just laugh. They knew we did not need them.

We usually welcomed each other’s hand-me-downs. My oldest brother would say that he was fortunate to be built differently than his older sisters. He did not have to wear the little one-piece railroad-engineer-like coveralls with the trap door that my sisters and I wore.

My dad would jokingly threaten him, but he never wore them.

I would be lying if I said that our family was generous in the winter. There was no money, nothing to give.

Summers were different. We had a big garden. My mother would say we had enough for everybody. I am not bragging, but we always had the biggest and sweetest melons and the crunchiest cucumbers. Our green chile was to die for. The tomatoes we would pinch and eat like apples. We ate like royalty; so did our neighbors. That’s when life was good.

As we all grew older, we began having our own families. Today, we often discuss the old times. We don’t talk about life being harder, it was just different. We mostly laugh. Our family was not the only one experiencing hard times and blessed times. This story rings true with many of you. My story is not unique.

In later years, we would tease my mom about her treasure chest. It contained many medals, holy cards, and rosaries. They were gifts she received from many religious groups. She would send money in response to mail solicitations and receive her treasures in return. Each one of us owns at least one of her treasures. She took each request seriously and sent a donation. It wasn’t a lot.

“It is a sacrifice, Iris,” she would say. “We don’t make as many sacrifices as we should. These people need it more than I do. I have everything I need.”

So why do I give? Because, like my mother, now I can. Can you?



## ECP campaign runs Oct. 5-23



IN THE TANK FOR ECP — Public Relations and Communications Center 3600 Director George Rhynedance takes a dive for a good cause, rallying support during field day activities at Hardin Field on Oct. 6 for the 2009 Sandia ECP campaign. At right, George’s wife Cris celebrates after her well-placed toss sends her husband into the drink. George, one of several members of senior management to offer

themselves up as dunk tank targets, goaded and prodded employees into ponying up five bucks — or disposable diapers or wet wipes — for three ball tosses. Proceeds went to Cuidando Los Ninos, a United Way agency. It was all in good fun and set the stage for a successful 2009 campaign. Other Oct. 6 activities included a fun run/walk and prize giveaways. (Photos by Randy Montoya)

## 2008 giving a new Sandia record

**Total from Sandians and Sandia retirees was \$3.78 million – Participation rate was 76 percent**

**Giving made easy — Three ways to give:**

- Designate an agency. Go to [give.sandia.gov](http://give.sandia.gov).
- Community Fund. Go to [give.sandia.gov](http://give.sandia.gov).
- Do both at [give.sandia.gov](http://give.sandia.gov).

**Community Fund** (Give United) supported by a money-back guarantee.

When you give to the Community Fund, your donation is combined with the donations of others to support more needs at once in central New Mexico. Agencies submit proposals to United Way and panels made up of your peers (including many Sandians) decide how the money is allotted. Last year \$8,195,678 was requested; only \$4,763,268 was available.

**These are examples of Community Fund giving:**

- **All Faiths Receiving Home, Inc.**

Joseph, 16, and his brother Alex, 15, were homeless teenagers who lived on the streets, in shelters, or with friends. Their parents were incarcerated. They

ran away when their uncle became abusive. The boys continued to attend school, but were often absent and in trouble due to their behavior. The school counselor referred Joseph and Alex to All Faiths after learning of their problems. An All Faiths advocate quickly became a lifeline to the boys, talking with them by phone or visiting daily until housing was located. The advocate worked to gather adults from the legal system, child protective services, and schools to make future plans for the boys’ safety. The boys were seen by All Faiths therapists to help with their anger as a result of the abuse, and the advocate taught the boys ways to cope with their daily frustrations. Through the work of agency staff, Joseph and Alex are in a safe home, have learned how to have positive interactions with teachers and peers, and are beginning to trust again.

- **The Storehouse**

Mary’s children had never tasted cottage cheese. Mary was not able to buy any dairy products for her

two preschool children; bakery items were beyond reach. Mary lived two blocks from a neighborhood market and checked the market’s dumpster each evening for produce and other items that might be edible. Mary was referred to The Storehouse by a case worker. On her first visit to The Storehouse she took home approximately 90 meals, including milk, fruit, lettuce, cheese, and a wide variety of bread — products made available through The Storehouse only because of the Albertsons Food Rescue Program.

### Agency Designation

In designating an agency, you take total control. The only thing required is going to the ECP website — [give.sandia.gov](http://give.sandia.gov) — and making your selection. The agency uses the money as they see fit; no panels are involved.

If you have questions, contact Pam Catanach at [pcatana@sandia.gov](mailto:pcatana@sandia.gov). Any nonprofit is eligible. When you select an agency, the money goes directly to the designated agency.



# Retiree medical plans 2010 and 2011 for Pre-Medicare and Medicare members — Frequently Asked Questions

**Q:** How will pre-Medicare and Medicare-eligible health plans work in 2010 and 2011? What if I have a combination pre-Medicare and Medicare-eligible family?

**A:** You and your spouse are each eligible for certain health care plans as listed below in the tables.

Table A: 2010 Combo family plans

Pre-Medicare Retiree Medical Plan	Medicare Retiree Medical Plan
Sandia Total Health administered by UnitedHealthcare	Presbyterian MediCare Preferred Provider Organization (PPO) Plan (NM Medicare Advantage Plan)
UHC Premier PPO	UHC Senior Premier PPO
CIGNA In-Network	Lovelace Senior Plan (NM Medicare Advantage Plan)
Kaiser Permanente Traditional HMO (CA Only)	Kaiser Permanente Senior Advantage (CA Medicare Advantage Plan)

Table B: 2011 Combo family plans (retired on or before Dec. 31, 2010)

Pre-Medicare Retiree Medical Plan	Medicare Retiree Medical Plan
Sandia Total Health (administrator(s) to be announced in 2010)	Sandia-sponsored Medicare Advantage Plan(s) (administrator(s) to be announced in 2010)

Table C: 2011 Combo family plans (retired on or after Jan. 1, 2011)

Pre-Medicare Retiree Medical Plan	Medicare Retiree Medical Plan
Sandia Total Health (administrator(s) to be announced in 2010)	Retiree provided an allowance to purchase individual Medicare Advantage Plan or Medicare Supplemental Plan in the marketplace.

**Q:** Will UnitedHealthcare administer the Sandia Total Health and Sandia-sponsored Medicare Advantage plans? Will my provider be in the network in 2011?

**A:** Sandia is required to do competitive source selection for medical plan administrative services contractors for both the Sandia Total Health and Sandia-sponsored Medicare Advantage program(s) for 2011 and beyond. Network provider (e.g., physicians and facilities) disruption issues will be taken into consideration during this process. The administrator selected will provide a national network (as it exists today) to accommodate retirees living in any state. The outcome of the source selection process will be announced in time for the 2011 Open Enrollment period, conducted in fall 2010.

**Q:** Will Medicare-eligible retirees need to enroll in Medicare Parts A and B? Can I have two Medicare Advantage Plans?

**A:** You *must* be enrolled in both Medicare Parts A and B to be enrolled in a Sandia-sponsored or individual Medicare Advantage Plan. You cannot be enrolled in two separate Medicare plans. For example, if you enrolled in another group or individual Part D prescription drug plan, you cannot also enroll in a Medicare Advantage plan with prescription drug coverage.



Your Health. Take Charge.

## Benefits Choices 2010 Open Enrollment

- Nonrepresented (nonunion), MTC, and OPEIU represented employees — Oct. 19-Nov. 4, 2009 (5 p.m. MST)
- SPA represented employees — Dec. 1-3, 2009 (5 p.m. MST) (This change is due to union contract bargaining)
- Benefits Choices 2010 Open Enrollment for retirees, surviving spouses, and COBRA participants is Oct. 26-Nov. 10.

### More information

Open Enrollment website (employees and retirees): <http://hbe.sandia.gov>

Sandia Laboratories Customer Service  
(NM) HBE Customer Service <http://hbe.sandia.gov>  
505-844-HBES (4237) or 1-800-417-2634, ext. 844-HBES (4237)  
Hours: 7:30 a.m.-5 p.m. MDT

# An anomaly has been found

By Iris Aboytes

“An anomaly has been found.”

Those are not the words a woman wants to hear when she gets a mammogram. Yet those are the words Sandian Florence Christman (10244) heard.

Florence had seen the HBE notice about a mobile mammogram unit coming to IPOC in April. “I had no more excuses,” says Florence. “I was a year overdue in getting the exam. Besides, the mobile unit would be parked in the IPOC parking lot. I made an appointment and feel fortunate I did.”

A few days after her exam, she received a letter. An anomaly had been found. She went to her primary care physician, who recommended an ultrasound. The ultrasound detected “something.” An MRI identified a slow-growing cancer. It was less than one centimeter in size. She was fortunate because it was caught early.

“I am very pragmatic,” says Florence. “My focus was to deal with it, and get on with things.” It took several weeks from the time she received the notice to having the biopsy and confirming she had breast cancer. The normal time from the initial tests to the operation to remove the lump is usually one month. However, Florence wanted more information before she decided which path to take. Therefore, the time period was pushed out a few weeks. Once she was well informed, she made her choice and scheduled



FLORENCE CHRISTMAN

the lumpectomy.

Florence’s healing after the lumpectomy took five weeks. She is now undergoing six weeks of daily radiation treatments. The radiation treatment takes only a few minutes and kills off any cancerous cells that may be hiding out in the breast. “The actual procedure takes less than 15 minutes,” says Florence.

After the radiation, she will take pills (chemo) that are intended to destroy all the abnormal cells she might have in her body.

“During my treatments at the New Mexico Cancer Center I have met many incredible women,” says Florence. “We are all grateful that new treatments are constantly evolving.

“What I have learned is not to put anything off,” says Florence. “Had my cancer not been caught at this very early stage, the prognosis would have been much worse. I am very grateful to Sandia for providing this service to its employees. Thank you so very much.”

### Mobile mammogram returns

HBE is bringing Assured Imaging’s full-field digital mammography vehicle to offer free full-field mammogram appointments to Sandia employees, dependents, and non-Medicare retirees.

Full-field digital mammography allows the radiologist to more fully evaluate microcalcifications and focus on areas of concern.

*“What I have learned is not to put anything off.”*

— Florence Christman

Call Assured Imaging at 1-888-233-6121 to schedule an appointment. For more information go to [hbeup-date.custhelp.com/app/answers/detail/a\\_id/1519](http://hbeup-date.custhelp.com/app/answers/detail/a_id/1519)

Appointments are available from 8 a.m.-5 p.m.

- Oct. 27 - Juan Tabo at Candelaria Sandia Labs Federal Credit Union 3707 Juan Tabo Blvd. NE, Albuquerque
- Oct. 28 - Cottonwood Sandia Labs Federal Credit Union 3740 Ellison Rd. NW, Albuquerque
- Oct. 29 - Paseo del Norte Sandia Labs Federal Credit Union 8920 Holly Ave. NE, Albuquerque
- Oct. 30 - Los Lunas Sandia Labs Federal Credit Union 2700 Palmilla Rd. NW, Los Lunas

### Who is eligible?

Any employee, spouse, or dependent covered under the UnitedHealthcare or Cigna health plans by Sandia can get a baseline mammogram once between the ages 35 and 39, and annually upon turning 40. High-risk women with an immediate family history (mother or sister) of breast cancer are eligible for an annual mammogram at age 25.

Retirees who do not have Medicare or any other primary insurance are also eligible. For covered dependents of retirees, the individual must meet the age criteria above and also would not be eligible if they have other primary insurance.

**Note:** Medicare covers mammograms but if you have other primary insurance that plan would pay first.

### Who is not eligible

Dependents or individuals who have waived health care coverage through Sandia are not eligible for the mobile screening events held in New Mexico at this time.

Nursing mothers or mothers who have nursed in the last three months are not eligible.



# Now you see it, now you don't

Story by Iris Aboytes • Photos by Paul Silva

The top 85 feet of the Tech Area 5 stack, a 125-foot-landmark near the entry to Tech Area 5, was removed in mid-September. The original stack was replaced in 1983 due to significant cracking.

"The stack was a landmark and will be missed," says Paul Silva (4824), "but it no longer supported Sandia's mission."

The annual maintenance costs, coupled with a potential safety hazard, provided the motivation to remove the upper portion. The maintenance was required because of structural damage incurred due to normal environmental factors (wind load). During high winds, the movement of the stack was definitely visible.

The stack is directly connected to the old Tech Area 5 Hot Cell ventilation system. The Hot Cell is in a cold standby condition with no foreseeable work. There are no other projects that would rely on the height of the stack. The exhaust stack is not connected to any active nuclear facility ventilation systems.

The stack modification project involved Sandia Facilities personnel led by Paul, Tech Area 5 personnel led by Norm Schwes (1383), ECI Construction, and Crane Services.

The stack was six feet in diameter and was made of quarter-inch and 5/16-inch steel plate. The fins at the top were spoilers, installed to disrupt air flow. The removed section of the stack weighed approximately 20,000 pounds.

The modification project was performed on the weekend to ensure low personnel occupancy during the construction activities. Before the activity began on Saturday morning, the operation had to be shut down due to prohibitive wind speeds. This reprieve for the stack was short-lived as the weather cooperated on Sunday, and the ECI and Crane Services contractors safely removed the stack in two pieces. Due to the high levels of air filtration in this ventilation system, all radiation surveys, inside and out, were contamination-free and the sections were subsequently sent to Reapplication.



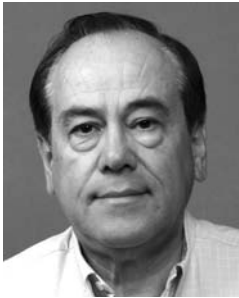


# Mileposts

*New Mexico photos by Michelle Fleming  
California photos by Randy Wong*



Harvey Ogden  
40 6325



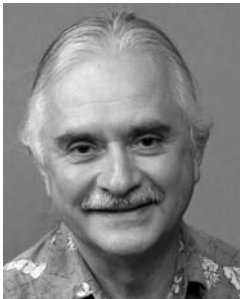
Jose Montoya  
35 2132

## Recent Retirees

 Paul Brannan 30 6439	 Don Daigle 33 2626	
 Glen Gabaldon 31 10264	 Charles Harmon 28 5213	 Charles Valerio 25 4844



Mark Sloane  
35 2719



Paul Atencio  
30 5933



Gerald Crowder  
30 6451



Len Duda  
30 5737



Richard Fairbanks  
30 1033



David Holcomb  
30 6735



Penny MaryLynn Jones  
30 522



Dennis Mowry  
30 2952



John Nevers  
30 5644



Gordon Smith  
30 12870



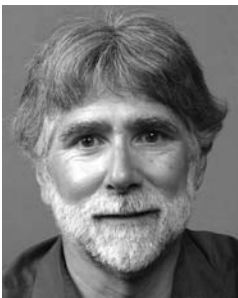
Mark Snell  
30 6754



Chuck Andraka  
25 6337



Terrence Aselage  
25 1514



Steve Casalnuovo  
25 1714



Dean Dobranich  
25 1514



Michael Eaton  
25 6452



Cathleen Anne Ehgartner  
20 4122

Brian Ehgartner  
25 6732



Diana Gonzales  
25 411



Orlando Griego  
25 4826



Thomas Henderson  
25 2995



John Jojola  
25 5445



William King  
25 6402



Glenn Kubiak  
25 8600



Jannifer Levin  
25 9544



Dorothy Meister  
25 2626



William Miller  
25 5917



John Nagel  
25 2127



Peggy Schroeder  
25 9538



Norman Stephens  
20 2996



L. Mason Blach  
20 414



Jo Cunningham  
20 10248



Jane Farris  
20 10520



Roy Fitzgerald  
20 10260



Camille Gibson  
20 10243



Thomas Grasser  
20 1512



Scoti Hagerman  
20 2913



Raymond Lemke  
20 1641



Timothy Meisenheimer  
20 1748





# Celebrating Hispanic heritage

*Photos by Randy Montoya*

SOUTHWEST MUSICIAN and recording artist Roberto Griego (above) performs for attendees at a Diversity Awareness Event celebrating National Hispanic Heritage Month. In the photo at right, a young performer from the group Mariachi Bernalillo samples some of the abundant food at the event, which was held in and around the Steve Schiff Auditorium on Sept. 29.



## About Hispanic Heritage Month

Hispanic Heritage Month recognizes the contributions of Hispanic Americans to the US and celebrates Hispanic heritage and culture. The observation, started in 1968 as Hispanic Heritage Week, was approved by President Lyndon Johnson; it was expanded by President Ronald Reagan in 1988 to cover a 30-day period starting on Sept. 15 and ending on Oct. 15.

Sept. 15 was chosen as the starting point for the celebration because it is the anniversary of independence of five Latin American countries: Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua. They all declared independence in 1821. In addition, Mexico, Chile, and Belize celebrate their independence days on Sept. 16, Sept. 18, and Sept. 21, respectively. (From Wikipedia)

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The Smithsonian Institution offers an online virtual tour celebrating Hispanic heritage. The tour offers an opportunity to learn more about specially selected objects from the Smithsonian collection — objects that tell a story about the nation's Hispanic heritage. To take the self-guided, self-paced tour, go to the Smithsonian website at <http://heritagetours.si.edu/hhm.html>.



The 2009 Diversity Awareness Event celebrating Hispanic Heritage Month was held on Sept. 29 at the Steve Schiff Auditorium. The event, sponsored by the Hispanic Leadership Outreach Committee, honored the achievement of Hispanics and celebrated the independence of many Latin American countries.

Just before 11 a.m. drums from the Abel Lucero Band invited all within their hearing to the festivities.

The event had a great turnout, with Sandia, Air Force, and DOE employees enjoying the entertainment, food, and activities. In addition to the Abel

Lucero Band, entertainment included Mariachi Bernalillo and New Mexico musician and recording artist Roberto Griego.

The Salsa, Chile, and Cultural Dessert Contest took place in the lobby of the Steve Schiff Auditorium. A panel of judges selected the winners, then tasting was open to all attending the event.

Additional community outreach events celebrating Hispanic Heritage Month include the Sandia-sponsored Youth Art Contest themed "Our Culture, Our Destiny, Now and for the Future."